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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* LIN WANG, PETE MILLER,  
JEFF UNDERWOOD, TONYA ARMSTRONG,  
MICHAEL KRAMER, SUSAN FREERS,  
ROGER MCPHERSON, E. DANIEL HUBBARD  
and TERRY ANDREN

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Appeal 2009-003246  
Application 10/687,498  
Technology Center 1700

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Decided: November 12, 2009

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Before CATHERINE Q. TIMM, LINDA M. GAUDETTE, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's  
decision rejecting claims 1-6 as unpatentable over Nakatsuka (US 4,076,846,

issued Feb. 28, 1978) in view of Altieri (US 5,849,233, issued Dec. 15, 1998), and the rejection of claim 7 over the above references and further in view of Redding (US 5,455,342, issued Oct. 03, 1995). We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

## II. DISPOSITIVE ISSUE

The dispositive issue on appeal is: have Appellants shown that the Examiner reversibly erred in finding that Nakatsuka teaches or suggests a process including extruding a hydroxyalkyl starch meeting the two-zone requirement of claim 1?

We answer this question in the affirmative.

## III. PRINCIPLES OF LAW

The examiner bears the initial burden of presenting a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). In order to establish a *prima facie* case of obviousness, the examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988).

Where the examiner has reason to believe that a claimed property may, in fact, be an inherent characteristic of the prior art product, an examiner possesses the authority to require applicant to prove that the subject matter shown to be in the prior art does not in fact possess the property. *In re Best*, 562 F.2d 1252, 1254-55 (CCPA 1977). However, before an applicant can be put to this burdensome task, the examiner must

provide enough evidence or scientific reasoning to establish that the examiner's belief that the property is inherent is a reasonable belief. *Ex parte Levy*, 17 USPQ2d 1461, 1464-65 (BPAI 1990); *Ex parte Skinner*, 2 USPQ2d 1788, 1788-89 (BPAI 1986).

#### IV. FINDINGS OF FACT

Claim 1, the only independent claim on appeal reads:

1. A process for preparing a film, comprising:

providing a solution of an extruded starch product, said starch product having been prepared by a process comprising

providing a *hydroxyalkyl starch*, said starch being *derivatized with a hydroxyalkyl substituent having from 2 to 6 carbon atoms*; and

*extruding said starch in an extruder*, said extruder having a barrel, a die, and at least one rotating shaft, *said barrel having at least first and second zones, said first zone being upstream from said second zone, the temperature in said first zone being insufficient to gelatinize said starch to a gelatinization level of at least 95% and the temperature in said second zone being sufficient to gelatinize said starch to a gelatinization level of at least 95%*, said starch being extruded in the presence of total moisture in said barrel no greater than about 25% by weight of said starch, said process including the step of controlling the rotational speed of said shaft to impart a specific mechanical energy to said starch sufficient to result in a soluble extruded starch product that is capable of extrusion through said die at said rotational speed;

said solution having been prepared by mixing said starch product with water; and

forming a film from said solution.

(Br., Claims App. i, emphasis added.)

The Examiner cites to column 13, lines 34-37 of Nakatsuka for its description of extruding in a barrel at the following conditions: 30° - 50° C (water cooling) at the part below the hopper, 120° - 160° C, at middle part, and 160° - 200° C at front part (Ans. 3). According to the Examiner,

Nakatsuka clearly discloses an extruder barrel having at least two zones at Column 13, lines 34-37. Also as previously noted, gelatinization occurs at about 150C-175C, so it is being interpreted that the cooler first zone would be insufficient to gelatinize the molding material, while the subsequent second/third zone would be sufficient for gelatinization.

(Ans. 6.)

The Examiner further finds that column 6, lines 14-19 “clearly describes gelatinization ‘during the course of manufacturing the molding compositions as well as the molded articles.’” (Ans. 6.)

Appellants contend that Nakatsuka fails to teach extruding the starch in an extruder having two zones as claimed. According to Appellants, column 6, lines 14-19 refers to gelatinization in the starting materials, not upon extrusion (Br. 11-12). Further according to Appellants, because the material processed in Nakatsuka is a complex of starch with protein, it is unclear whether this material has a gelatinization temperature (Br. 12; Reply Br. 4). Appellants also contend “the Examiner’s general assertion as to the gelatinization temperature of starch is unsupported.” (Reply Br. 4.)

Nakatsuka forms a water-soluble molding composition comprising starch material, an inorganic salt of a protein material, plasticizer, and a lubricant (col. 3, ll. 64-68). The starch and protein-based materials may chemically react to some degree (col. 6, ll. 34-47).

Column 13, lines 33-37, discloses a step of molding that occurs after a step of milling a composition containing high-amylose cornstarch (starch

component), sodium caseinate (protein component), and glycerol (plasticizer component) (Nakatsuka, col. 12, ll. 11-35). Milling occurs at a surface temperature of 120 °C (col. 12, ll. 20-21). The milled composition is introduced into the barrel of an injection molding machine with a hopper end at a temperature of 30-50 °C, a middle part at 120-160 °C, and a front part at 160-200 °C (col. 13, ll. 31-37).

Column 6, lines 14-19 is a continuation of a discussion of high-amylose starch starting on column 5, line 49. High-amylose starch has a higher gelatinization temperature compared with common starches (col. 5, ll. 57-60). Gelatinized high-amylose starches form films with good performance characteristics (col. 5, l. 49-col. 6, l. 24).

Column 14, lines 5-12, disclose that an Example 2 composition is extrusion molded under the conditions of Example 1, i.e., milled in a barrel of 120° - 160° C and extruded through a die to form films (col. 12, ll. 39-52). This composition includes hydroxyethylated starch (Table 3, col. 13, ll. 56). Unlike the extruded composition of Example 1, the Example 2 composition is not injection molded using a multi-zone barrel.

## V. ANALYSIS

The Examiner offers no evidence in support of the finding that “gelatinization occurs about 150C-175C.” (Ans. 3.)

According to the Examiner, column 13, lines 33-37 of Nakatsuka describes an extruder having varying temperature zones, i.e., a first zone at 30-50 °C and a second zone at 120-200 °C such that the first zone does not allow gelatinization but the second zone allows gelatinization (Ans. 6). Column 13, lines 33-37, describes injection molding a composition

including high-amylose corn starch and sodium caseinate protein (*see* col. 12, ll. 14-18). We agree with Appellants that the Examiner has offered no reasoning, nor pointed to any evidence of record, indicating that the starch-protein composition of Nakatsuka's Example 1 undergoes gelatinization.

In order to establish that gelatinization inherently occurs as claimed within the injection molding machine barrel of Nakatsuka's Example 1 process, the Examiner must provide sufficient evidence and technical reasoning to establish that gelatinization would not occur in the 30-50 °C range of the first zone of Nakatsuka's injection molding machine barrel, but would occur in a later 120-200° C zone(s). The Examiner has not provided the required evidence in support of a finding of inherency.

We further note that the extruding step of claim 1 is a step of extruding "said starch." Said starch must be read as referring to the hydroxyalkyl starch recited in the providing step of the claim; that is the only "starch" referred to in the claim. The Examiner has not established that the composition processed in Example 1, the Example containing the column 13 disclosure relied upon, contains hydroxyalkyl starch. There can be no gelatinization of hydroxyalkyl starch if that component is not contained in the composition.

The composition processed in Example 2 contains hydroxyalkyl starch, but the Example 2 composition is processed according to the extrusion molding process disclosed at column 12, lines 39-59 of Nakatsuka, not the injection molding process of column 13, lines 31-37. Nakatsuka only discloses one temperature zone for the barrel of that extrusion molding apparatus (Nakatsuka, col. 12, ll. 43-44).

Moreover, in both Examples 1 and 2, the composition is milled at 120 °C before molding (Nakatsuka, col. 12, ll. 20-35). It is possible that gelatinization may occur in the milling step. It is not clear whether the Examiner considered the effects of the milling step in the determination of inherency.

Claim 1 further requires that the extruded product be formed into a solution by mixing the extruded starch product with water and forming a film from the solution. The Examiner finds that Nakatsuka teaches forming a film, but the portions of Nakatsuka cited by the Examiner (col. 4, ll. 5-13 and col. 12, ll. 20-24) do not support the Examiner's finding. Column 4, lines 5-13 disclose methods of molding the starch-protein composition including methods of forming films and column 12, lines 20-24 discloses the initial milling of the starting materials. Neither of the relied upon portions of Nakatsuka discloses mixing an extruded starch product with water and forming a film from that solution.

Redding and Altieri are relied upon for other limitations of the claims. These references as relied upon by the Examiner do not remedy the above discussed deficiencies in the rejections.

## VI. CONCLUSION

We do not sustain the rejection of claims 1-6 under 35 U.S.C. § 103(a) over Nakatsuka and Altieri. Nor do we sustain the rejection of claim 7 over those references further in view of Redding.

## VII. DECISION

The decision of the Examiner is reversed.



Appeal 2009-003246  
Application 10/687,498

REVERSED

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